Trend Study 16C-11-02

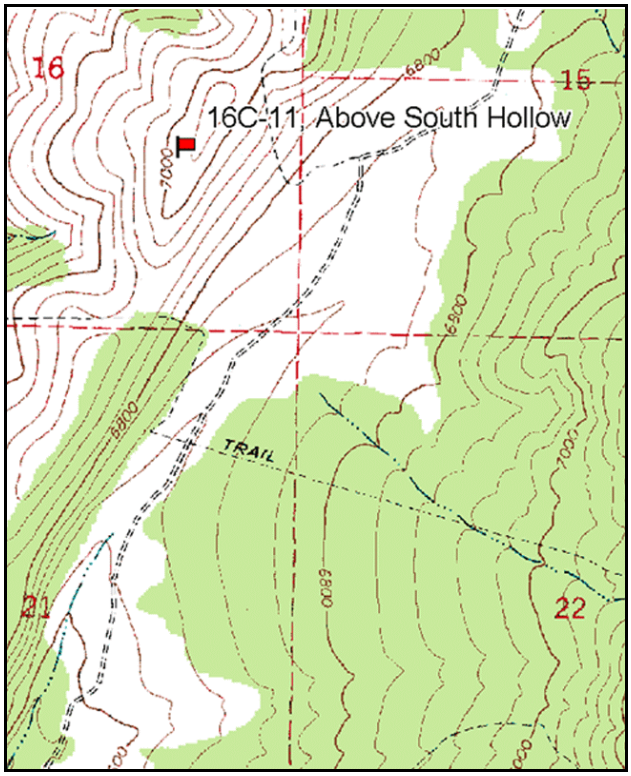
Study site name: Above South Hollow . Vegetation type: Chained, Seeded P-J .

Compass bearing: frequency baseline 255 degrees magnetic.

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

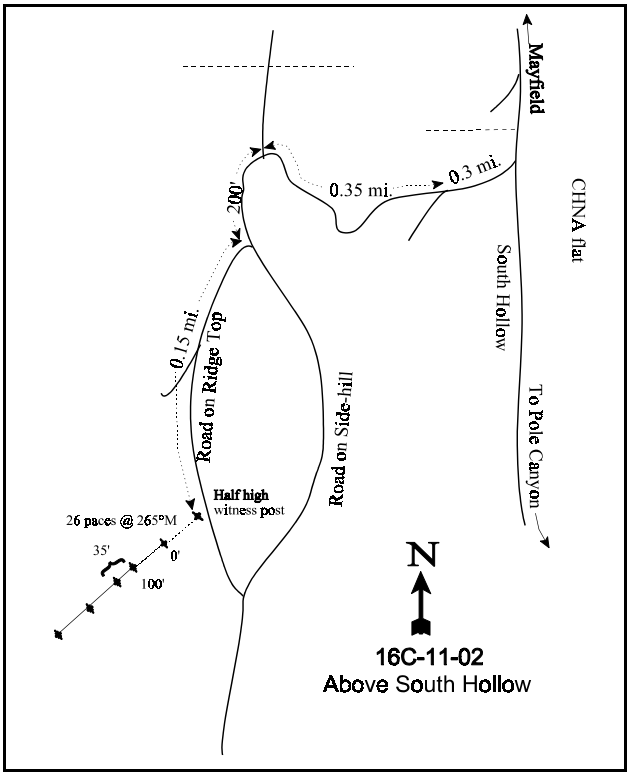
LOCATION DESCRIPTION

From the Mayfield post office, go 1.75 miles up the Twelve Mile Canyon Road. Take the right hand fork south down South Hollow 3 miles to a large rabbitbrush flat. Take the fork past the fence west for 0.3 miles to another fork. Take the right fork up a steep dugway for 0.35 miles to a fence line where the road forks again. Take the left fork south for 200 feet to another fork. Take the right fork up a very steep dugway for 0.15 miles to a half high witness post on the west side of the road. From here, walk 26 paces at 265 degrees magnetic to the 0-foot baseline stake.



Map Name: Mayfield

Township 20S , Range 2E , Section 16



Diagrammatic Sketch

GPS: NAD 27, UTM 12S 4324210 N 440347 E

DISCUSSION

Above South Hollow - Trend Study No. 16C-11

The Above South Hollow study samples another 30 year old chaining on the upper slope of the Mayfield Face west of South Hollow. Evidence of the treatment is found primarily with the presence of seeded grasses as juniper and pinyon have become well established again on the site. The study is on a 20 to 25% slope with a westerly aspect at an elevation of 7,000 feet. Pellet group quadrat frequencies in 1997 showed moderate use of the site by deer, with elk and cattle use being light. In 2002, pellet group transect data estimated 60 deer days use/acre (149 ddu/ha), 8 elk days use/acre (20 edu/ha), and 11 cow days use/acre (27 cdu/ha).

According to the soil survey, the prominent soils along the upper side of the South Mayfield Face are the Fontreen series soils. This site is located on a ridge with an area of shallow Lodar very channery loam. This soil is somewhat excessively drained, 10-20 inches deep over bedrock, and rock fragments are normally present up to 50% in the surface layer. Soils at the site have an estimated effective rooting depth of 11 inches and soil temperature is 58°F at about 15 inches in depth. Soil textural analysis indicates a clay loam which is neutral in reactivity (pH 7.1). Combined rock and pavement cover was estimated at about 12% in 1997, increasing to 30% in 2002. With drought conditions in 2002, more rock and pavement were exposed with decreased cover of perennial grasses. Bare soil also increased from 9% to 17% between 1997 and 2002. Litter cover is satisfactory, averaging 51% in 1997 and 2002, with most being concentrated around trees. The erosion condition class assessment determined the site to be stable in 2002.

The pinyon-juniper overstory that existed prior to treatment has again regained dominance on this site. Total pinyon-juniper canopy cover was estimated at just under 28% in 2002 from line-intercept data. The two species have a combined density of 157 trees/acre from point-center quarter data taken in 2002. Under these canopy cover conditions, the herbaceous understory will be negatively effected. Retreatment of the pinyon-juniper overstory will have to be done in the near future if this site is to maintain a healthy understory. Gambel oak had an estimated density of 280 stems/acre in 1997, increasing to 760 stems/acre in 2002. The oak population shows good vigor, low decadence, and light to moderate use. During the initial reading in 1989, 27% of the oak was classified as being heavily hedged. Preferred browse is limited to true mountain mahogany (120 plants/acre in 2002) and bitterbrush (80 plants/acre in 2002) being the most important species. Both species had high decadence and poor vigor and were heavily browsed in 2002. The combination of drought and competition with an increasing pinyon-juniper overstory play a role in the depressed condition of mahogany and bitterbrush.

Perennial grasses are moderately abundant on the site. Grass production was high in 1997, but decreased considerably in 2002 with drought. Smooth brome is the most common seeded species, with crested wheatgrass being second in abundance. Smooth brome showed declines in both cover and nested frequency in 2002. This is a more mesic species so these declines are not surprising. As a group, perennial grass sum of nested frequency declined by 21% between the 1997 and 2002 readings. Forbs are sparse, and have not been significant on this site since it began to be monitored in 1989. The understory is fairly poor for a chained and seeded site.

1989 APPARENT TREND ASSESSMENT

As the juniper and pinyon trees continue to increase on this old treatment, the more valuable browse species will decline leading to a downward trend for deer winter range. No detrimental effects are evident on the abundant, vigorous grass understory. As long as there is adequate grass cover, the soil trend should remain stable.

1997 TREND ASSESSMENT

The trend for soils would be considered stable as percent bare soil has slightly decreased and almost half of the vegetative cover comes from the herbaceous species. The trend for browse is more difficult to determine because all of the preferred species are in relatively low numbers. Only true mountain mahogany shows any indication of any reproductive potential as it is the only species with seedlings. All appear to have good vigor, but little recruitment. This would result because of the pinyon and juniper increasing their overstory cover and competition with the vigorous understory of seeded grasses, especially rhizomatous grasses (smooth brome and intermediate wheatgrass). The trend is slightly declining because of the inevitable increases in canopy cover which will eventually lead to a decline in the preferred understory browse species. The herbaceous understory, which is dominated by grasses, has a stable overall trend.

TREND ASSESSMENT
soil - stable (3)
browse - slightly down (2), preferred species are in relatively low numbers
herbaceous understory - stable (3)

2002 TREND ASSESSMENT

Soil trend is slightly down. Bare soil increased, and cover and nested frequency of herbaceous vegetation decreased. Even with these changes, the ratio of protective cover (vegetation, litter, and cryptogams) to bare soil remains good, and erosion is minimal. Trend for browse is slightly down. The densities of mahogany and bitterbrush are stable, but low. Density will likely not increase as there was no recruitment of seedlings or young plants for either species in 2002. Increases in the density of preferred browse is also hampered by the continued increase in canopy of pinyon and juniper trees. Utilization is heavy on the preferred browse and decadency is high. Trend for the herbaceous understory is slightly down. Diversity is low, with smooth brome and crested wheatgrass being the most abundant. Sum of nested frequency for all perennial grasses combined declined by 21% in 2002. This decline is due in part to drought, but also the increasing canopy cover of pinyon-juniper. A retreatment project needs to be done to halt further deterioration of the understory.

TREND ASSESSMENT
soil - slightly down (2)
browse - slightly down (2)
herbaceous understory - slightly down (2)

HERBACEOUS TRENDS --
Herd unit 16C, Study no: 11

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'89	'97	'02	'89	'97	'02	'97	'02
G	Agropyron cristatum	94	105	92	39	46	39	3.54	.95
G	Agropyron intermedium	$_{b}$48	$_{b}$26	$_{a}$-	16	11	-	.13	-
G	Agropyron spicatum	-	1	3	-	1	1	.03	.03
G	Bromus inermis	$_{a}$231	$_{b}$271	$_{a}$236	77	86	81	11.03	5.71
G	Bromus japonicus (a)	-	-	3	-	-	1	-	.03
G	Carex spp.	$_{b}$13	$_{a}$3	$_{a}$-	5	2	-	.06	-
G	Oryzopsis hymenoides	$_{b}$13	$_{a}$-	$_{a}$-	6	-	-	-	-
G	Poa fendleriana	$_{b}$50	$_{a}$3	$_{a}$6	26	1	3	.03	.16
G	Poa secunda	$_{a}$-	$_{b}$17	$_{a}$-	-	6	-	.34	-

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'89	'97	'02	'89	'97	'02	'97	'02
Total for Annual Grasses		0	0	3	0	0	1	0	0.03
Total for Perennial Grasses		449	426	337	169	153	124	15.17	6.85
Total for Grasses		449	426	340	169	153	125	15.17	6.88
F	Astragalus convallarius	-	1	-	-	1	-	.00	-
F	Astragalus spp.	1	-	-	1	-	-	-	-
F	Convolvulus arvensis	1	-	-	1	-	-	-	-
F	Collinsia parviflora (a)	-	1	6	-	1	2	.00	.01
F	Cryptantha spp.	6	3	1	3	1	1	.03	.00
F	Descurainia pinnata (a)	-	5	-	-	2	-	.01	-
F	Medicago sativa	11	13	4	3	6	2	.87	.03
F	Microsteris gracilis (a)	-	$_{b}$30	$_{a}$-	-	11	-	.05	-
F	Penstemon humilis	9	-	-	4	-	-	-	-
F	Phlox longifolia	$_{b}$24	$_{ab}$9	$_{a}$2	9	4	2	.02	.01
F	Senecio multilobatus	3	-	-	2	-	-	-	-
F	Tragopogon dubius	1	9	1	1	5	1	.17	.00
F	Unknown forb-annual (a)	-	3	-	-	1	-	.00	-
Total for Annual Forbs		0	39	6	0	15	2	0.07	0.00
Total for Perennial Forbs		56	35	8	24	17	6	1.09	0.05
Total for Forbs		56	74	14	24	32	8	1.17	0.06

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Herd unit 16C, Study no: 11

Type	Species	Strip Frequency		Average Cover %	
		'97	'02	'97	'02
B	Cercocarpus montanus	4	4	1.48	.39
B	Chrysothamnus nauseosus consimilis	2	1	.00	.03
B	Juniperus osteosperma	13	9	9.55	6.90
B	Pinus edulis	5	6	3.54	6.50
B	Purshia tridentata	2	3	.30	.56
B	Quercus gambelii	4	9	2.09	1.99
Total for Browse		30	32	16.98	16.38

CANOPY COVER -- LINE INTERCEPT
Herd unit 16C, Study no: 11

Species	Percent Cover	
	'97	'02
Cercocarpus montanus	-	.42
Juniperus osteosperma	8.0	19.17
Pinus edulis	3.2	8.50
Purshia tridentata	-	.92
Quercus gambelii	2.4	1.50

Key Browse Annual Leader Growth
Herd unit 16C , Study no: 11

Species	Average leader growth (in)
	'02
Cercocarpus montanus	2.0
Purshia tridentata	2.9

Point-Quarter Tree Data
Herd unit 16C , Study no: 11

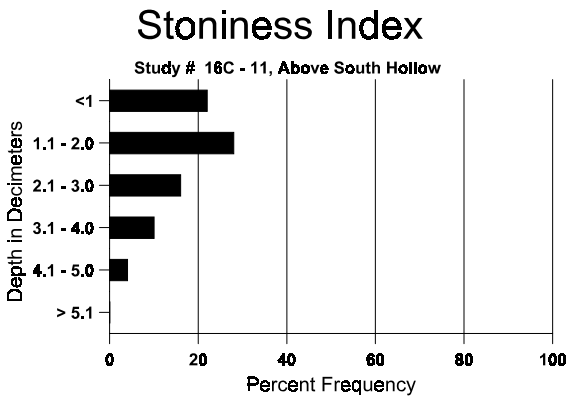
Species	Trees per Acre	Average diameter (in)
	'02	'02
Juniperus osteosperma	90	7.0
Pinus edulis	67	5.5

BASIC COVER --
Herd unit 16C, Study no: 11

Cover Type	Nested Frequency		Average Cover %		
	'97	'02	'89	'97	'02
Vegetation	322	278	9.00	31.20	23.18
Rock	192	215	8.00	3.42	9.11
Pavement	254	287	11.50	8.08	21.08
Litter	394	383	60.75	50.84	52.78
Cryptogams	11	-	0	.05	0
Bare Ground	190	240	10.75	9.65	17.61

SOIL ANALYSIS DATA --
Herd Unit 16C, Study no: 11, Above South Hollow

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
11.0	58.0 (15.4)	7.1	36.4	31.1	32.6	6.6	18.0	268.8	.9



PELLET GROUP FREQUENCY --
Herd unit 16C, Study no: 11

Type	Quadrat Frequency		Pellet Transect	
			Pellet Groups per Acre	Days Use per Acre (ha)
	'97	'02	'02	'02
Rabbit	14	18	-	-
Elk	9	2	104	8 (20)
Deer	31	36	783	60 (149)
Cattle	1	1	131	11 (27)

BROWSE CHARACTERISTICS --
Herd unit 16C, Study no: 11

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Cercocarpus montanus																		
S	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	1	-	-	1	-	-	-	20			1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	-	1	1	1	1	-	-	-	-	4	-	-	-	80	52	50	4
	02	-	-	-	-	-	-	-	1	-	1	-	-	-	20	44	39	1
D	89	-	-	1	-	-	-	-	-	-	-	-	-	1	33			1
	97	-	-	-	1	-	-	-	-	-	1	-	-	-	20			1
	02	-	-	-	-	-	5	-	-	-	1	-	2	2	100			5

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'89	00%	100%	100%	
'97	40%	20%	00%	+67%
'02	00%	83%	67%	+17%

Total Plants/Acre (excluding Dead & Seedlings)				
	'89	33	Dec:	100%
	'97	100		20%
	'02	120		83%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus nauseosus consimilis																		
Y	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	-	1	-	-	-	-	-	-	-	1	-	-	-	20	40	40	1
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20	13	6	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'89	00%	00%	00%	
'97	50%	00%	00%	-50%
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'89	0	Dec:	-
	'97	40		-
	'02	20		-

Cowania mexicana stansburiana																		
M	89	1	-	-	-	-	-	-	-	-	1	-	-	-	33	30	33	1
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'89	00%	00%	00%	
'97	00%	00%	00%	
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'89	33	Dec:	-
	'97	0		-
	'02	0		-

Ephedra viridis																		
M	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	39	29	0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	35	29	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'89	00%	00%	00%	
'97	00%	00%	00%	
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'89	0	Dec:	-
	'97	0		-
	'02	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Juniperus osteosperma																		
Y	89	2	-	-	-	-	-	-	-	-	2	-	-	-	66			2
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	02	-	-	-	-	-	1	-	-	-	-	-	-	1	20			1
M	89	2	-	-	2	-	-	1	-	-	5	-	-	-	166	61	67	5
	97	2	-	-	4	-	-	7	-	-	13	-	-	-	260	-	-	13
	02	6	-	-	2	-	-	-	1	-	9	-	-	-	180	-	-	9
X	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	80			4
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	100			5

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'89	00%	00%	00%	+17%
'97	00%	00%	00%	-29%
'02	00%	10%	10%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'89	232	Dec:	-
	'97	280		-
	'02	200		-

Pediocactus simpsonii																		
M	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	21	81	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'89	00%	00%	00%	
'97	00%	00%	00%	
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'89	0	Dec:	-
	'97	0		-
	'02	0		-

Pinus edulis																		
Y	89	2	-	-	-	-	-	-	-	-	2	-	-	-	66			2
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	1	-	-	-	-	-	3	-	-	4	-	-	-	80	-	-	4
	02	4	-	-	-	-	-	-	1	-	5	-	-	-	100	-	-	5

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'89	00%	00%	00%	+34%
'97	00%	00%	00%	+17%
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'89	66	Dec:	-
	'97	100		-
	'02	120		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Pseudotsuga menziesii																		
Y	89	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'89	00%	00%	00%	
'97	00%	00%	00%	
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'89	33	Dec:	-
	'97	0		-
	'02	0		-

Purshia tridentata																		
M	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	-	-	3	-	-	-	-	-	-	3	-	-	-	60	27	58	3
	02	-	-	2	-	-	-	-	-	-	1	-	1	-	40	29	77	2
D	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	2	-	-	-	-	-	-	2	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'89	00%	00%	00%	
'97	00%	100%	00%	+25%
'02	00%	100%	25%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'89	0	Dec:	0%
	'97	60		0%
	'02	80		50%

Quercus gambelii																		
S	89	2	-	-	1	-	-	-	-	-	3	-	-	-	100			3
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	89	16	1	-	24	-	-	9	-	-	50	-	-	-	1666			50
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	9	-	-	-	-	-	-	-	-	9	-	-	-	180			9
M	89	4	-	22	-	-	-	-	-	-	26	-	-	-	866	71	33	26
	97	-	2	-	12	-	-	-	-	-	14	-	-	-	280	47	49	14
	02	13	11	-	3	-	-	-	-	-	27	-	-	-	540	47	25	27
D	89	2	-	-	-	-	-	-	-	-	2	-	-	-	66			2
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	2	-	-	-	-	-	-	-	-	1	-	1	-	40			2
X	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'89	01%	28%	00%	-89%
'97	14%	00%	00%	+63%
'02	29%	00%	03%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'89	2598	Dec:	3%
	'97	280		0%
	'02	760		5%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Sambucus cerulea																		
M	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	22	31	0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'89	00%	00%	00%
'97	00%	00%	00%
'02	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'89	0	Dec:	-
	'97	0		-
	'02	0		-